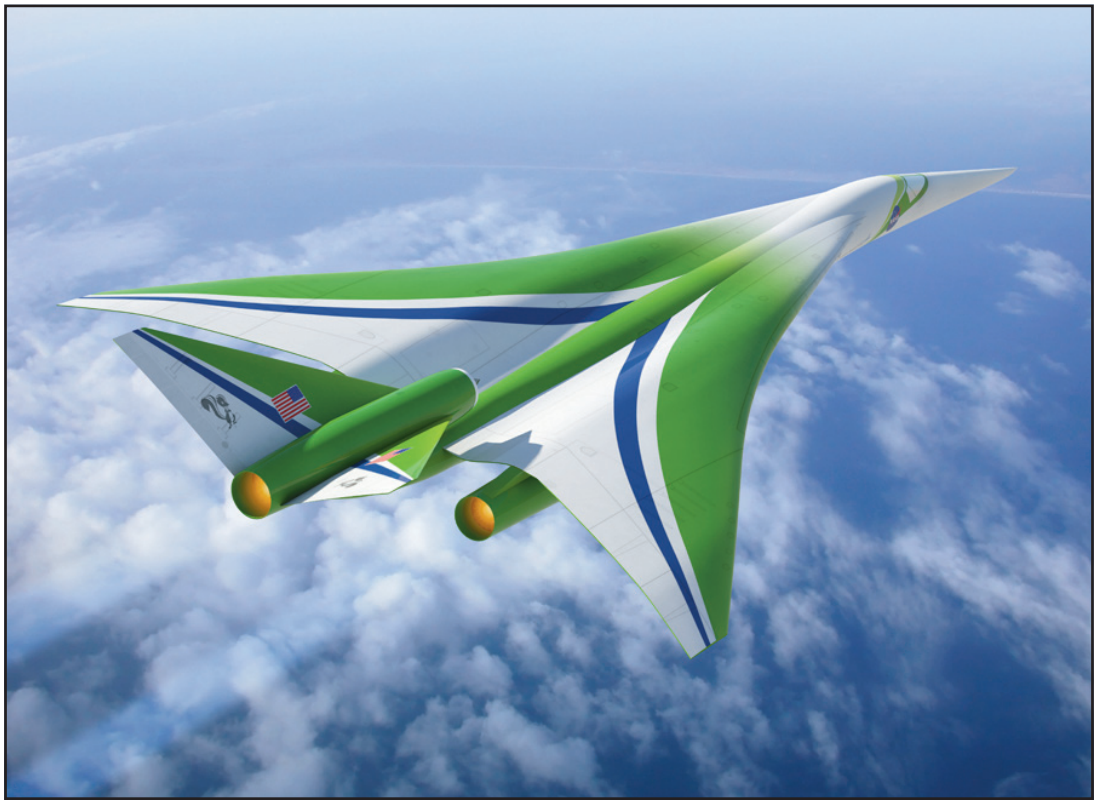
National Aeronautics and Space Administration

NASAfacts

Forging Future Flight: Aeronautics Research at the NASA Langley Research Center (Supersonics Research)

The NASA Langley Research Center (LaRC)
Located in Hampton, VA, LaRC was established as the nation's first civilian-led aeronautics research laboratory in 1917. NASA Langley serves as a world leader in "cutting edge" aeronautics research. Approximately $180 million was invested in aeronautics research at LaRC (2011). In 2010 NASA Langley contributed $946.8 million to the Virginia economy while supporting 8,624 jobs in the state of Virginia. In the Hampton Roads area in 2010, Langley contributed $886.7 million to the local economy while supporting 7,962 jobs.

Aeronautics Research Directorate (ARD)
The ARD at NASA LaRC manages projects that support four programs: (1) Integrated System Research Program, (2) Fundamental Aeronautics Program, (3) Aviation Safety Program, and (4) Airspace Systems Program. Research activities are performed under the specific projects described later. The NASA LaRC ARD facilitates external partnerships to complement the agency's aeronautics mission.



Supersonics Project
(Fundamental Aeronautics Program)

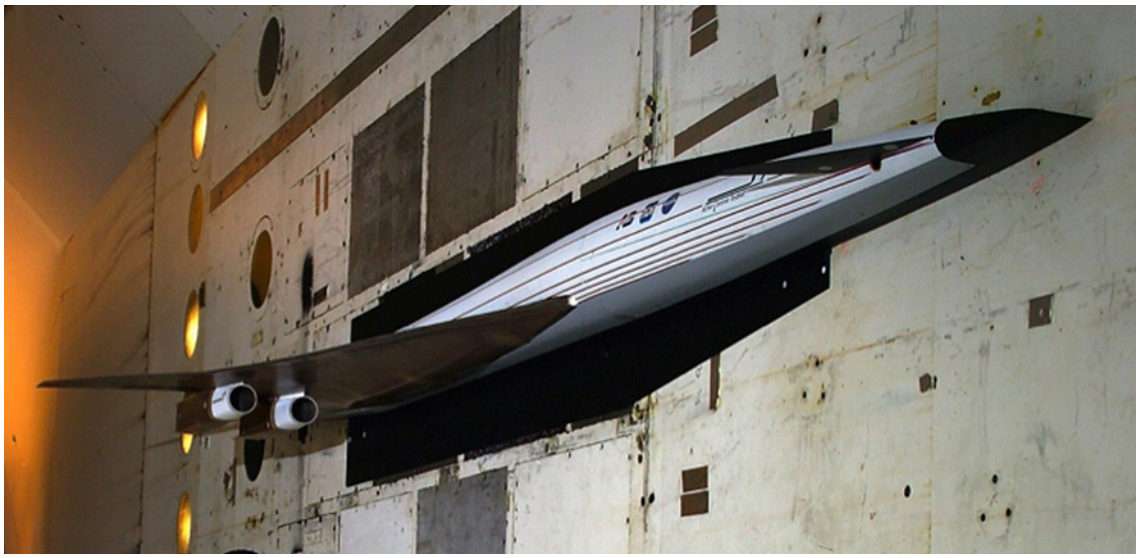
This LaRC-led project integrates work at LaRC, Glenn Research Center (GRC), Ames Reserach Center (ARC), and Dryden Flight Research Center (DFRC). The work at LaRC includes project management, wind tunnel studies, acoustical studies, and structural studies.

Primary Goal: To alleviate current barriers to routine supersonic vehicle operation over land in future civil and military aircraft fleets.

Technical Challenges:
- Sonic boom, airport noise, and high altitude emissions reduction
- Community response to low sonic boom noise
- Light weight durable materials and structures for supersonic cruise temperatures
- Computational methods for multidisciplinary design, analysis, and shape optimization
- Integration of supersonic aircraft in NextGen System

Recent Research Accomplishments:
Experimental assessment of supersonic aircraft designs that achieve the low boom goals has been conducted, along with testing of engine components that reduce takeoff noise.

LaRC Facilities and Capabilities Used in Research:
Unitary Plan Wind Tunnel
Transonic Dynamics Tunnel (TDT)
Interior Effects Room (Structural Acoustics Branch)
Supersonic Low Disturbance Tunnel (SLDT)
Combined Loads Test System Facility
James H. Starnes Structures and Materials Lab
Material Research, Composite Processing, Composites and Polymer Labs



The Supersonic Semispan Transport Model (S4T) in the Transonic Dynamics Tunnel. This highly complex model is used to develop flight control systems for advanced supersonic transport aircraft.

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For more information about NASA LaRC aeronautics research, visit http://aero.larc.nasa.gov/